

# ON THE SPECIES OF THE *POLYGONUS* GROUP OF *PROGOMPHUS* WITH A DESCRIPTION OF A NEW SPECIES (ODONATA, GOMPHIDAE)

by

JEAN BELLE

*Onder de Beumkes 35, Velp, The Netherlands*

## ABSTRACT

*P. occidentalis* spec. nov. (♂ holotype: San Antonio, Venezuela?) is described and elucidated by figures. The right pair of wings of *P. polygonus* Selys is depicted. A distribution map of *P. phyllochromus* Ris is given. The male of *P. abbreviatus* Belle is redescribed and its female is described for the first time. The four species mentioned here are forming an infrageneric group.

## INTRODUCTION

Since my revision of the genus *Progomphus* Selys in 1973, five new species have been described, two from Brazil (*P. victor* St. Quentin, 1973, and *P. perithemoides* Belle, 1980), one from Paraguay (*P. flinti* Belle, 1975), one from the USA (*P. bellei* Knopf & Tennessen, 1980) and one from Venezuela (*P. racenisi* De Marmels, 1983). In the present account a new species, *P. occidentalis*, is described from continental South America. The new descriptions show that the genus *Progomphus* is very rich in species, and that we still have not come to the end of our discoveries.

Together with *P. polygonus* Selys, *P. phyllochromus* Ris and *P. abbreviatus* Belle, the new species mentioned above belongs to an infrageneric group, the *polygonus* group. The members of this group correspond in the occurrence of an extra cubito-anal cross-vein in the wings (occasionally present in *P. abbreviatus*), the more or less broken distal side of the fore wing discoidal triangle, the medially excised posterior margin of the occipital plate, the wedge-shaped first pale antehumeral stripes, and the lack of a second pale antehumeral stripe immediately in front of the humeral sutures, while the abdomen of the females is about as long as the hind wings.

The new material of the *polygonus* group enables me to publish additional data on its known members. A figure of the right pair of wings of the female lectotype of *P. polygonus* is given. A distribution map of *P. phyllochromus* has been made with the aid of old and new records. The male of *P. abbreviatus*, known only from a sin-

gle male in poor condition, is redescribed from fully mature specimens; and the female of this species is described for the first time.

The material on which the present paper is based belongs to the institutions and personal collections mentioned below; the names are preceded by the abbreviations used throughout the text and followed by the names of the persons from whom material was received on loan or as a gift. These persons are most gratefully acknowledged here.

- ANSP — Academy of Natural Sciences of Philadelphia, Philadelphia; Dr. Dave Rentz.
- FSC — Florida State Collection of Arthropods, Gainesville; Prof. Dr. Minter J. Westfall, Jr.
- IML — Instituto Miguel Lillo, San Miguel de Tucumán; Dr. A. Willink.
- IRSN — Institut Royal des Sciences Naturelles de Belgique, Bruxelles; Dr. Georges Demoulin.
- IZM — Instituto de Zoología Agrícola, Maracay; Dr. F. Fernández Yépez and Mr. Jorge de Marmels.
- ML — Rijksmuseum van Natuurlijke Historie, Leiden; Dr. P. H. van Doesburg.
- MP — Muséum National d'Histoire Naturelle, Paris; Dr. Jean Legrand.
- SMF — Natur-Museum Senckenberg, Frankfurt am Main; Dr. Heinz Schröder.

***Progomphus polygonus* Selys, 1878**  
(fig. 23)

This species was described after two very teneral females from Merida, Venezuela. No additional material is available. In 1973 a lectotype was designated by me. In the present paper a depiction of the right pair of wings of the lectotype is published.

*P. polygonus* is the largest representative of the *polygonus* group. The reticulation of its wings is denser than that of the other members. The trigonal interspace in the fore wings of the lectotype starts with three rows of cells from the triangle outwards, three cells long. The distance between the nodus and the pterostigma is a little more than 2.75 times the length of the pterostigma. The abdomen of the female is relatively shorter than that of the females of the other members of the group. But the two females of *P. polygonus* are very teneral and fully mature females may have a relatively longer abdomen.

***Progomphus phyllochromus* Ris, 1918**  
(figs. 1—4, 6)

Material. — Argentina: Catamarca, Concepción, 15.i.1960, 1 ♂, 1 ♀, FSC; Salta, Orén (24 km of Agua Blancos), 9.v.1969, 1 ♂, IML, all A. Willink leg. — Colombia: 1 ♀ (ex coll. R. Martin), MP. — Venezuela: Aragua, Cumbre de Choroní, 13.viii.1957, 1 ♀ (author's collection), 1 ♀, J. Rácenis leg.; Miranda, Petare, 26.xi.1961, 1 ♂, Bordon leg., IZM.

This mountain species is chiefly Andean in its distribution and it occurs from the north coast of Venezuela to Catamarca in Argentina (distance between the two localities almost 6000 km). It has been recorded from Argentina, Bolivia, Colombia, Ecuador, Peru and Venezuela. In drawing up the distribution map (fig. 6) the present localities as well as those published earlier (Ris, 1918; Belle, 1973) were used.

The male from Salta is small and its wings have a less dense reticulation. The measurements are: total length, 35.5 mm; abdomen, 26 mm; hind wing, 23 mm; costal edge of pterostigma in fore wing, 3.3 mm. The fore wings have an open subtriangle, a single row of cells in the anal field, and no extra cubito-anal cross-vein. The frons is higher than is normally the case, and there is a weak development of a frontal ridge. The two wedge-shaped, (first) pale antehumeral stripes are rather narrow and they are almost parallel-sided on the dorsal half.

The female from Colombia has no extra cubito-anal cross-vein in the wings.

The larva of *Progomphus*, described by Needham (1941) as No. 14, most likely belongs to *P. phyllochromus*. The venational characters found in the pair of wings of this larva are in agreement with those of the adults of *P. phyllochromus*, and its place of capture (Estado Miranda) lies within the range of the species. Needham's larva No. 14 differs from that of *P. abbreviatus* described by De Marmels (1981b) in having the front margin of the middle lobe of the labium armed with a single median tooth instead of one submedian pair of such teeth (Needham, 1941: 240).

***Progomphus abbreviatus* Belle, 1973**  
(figs. 7—17)

Material. — Colombia: Dept. Magdalena, Sierra San Lorenzo (4500–5600 ft), Hacienda Cincinatti, 20.vii.1920, 1 ♂, ANSP; Prima, 1.vi.1965, 1 ♂, J. & B. Bechyne leg., IZM; Sierra de Perija (1350), Mission Finca Marganta (6 km SW of Socorpa, rocky stream, half shaded), 7—8.viii.1968, 1 ♂, Borys Malkin leg., ML. — Ecuador: 1 ♂, MP. — Venezuela: Miranda, Sebuacán, 16.x.1955, 3 ♂ (author's collection), 3 ♂ all Klisans leg.; Miranda, El Marqués, Quebrada Pasquire, Avila (1000 m), 10.x.1980, 1 ♀, J. de Marmels leg., IZM.

This species was described after a single male from Colombia. The type is in poor condition, very teneral and flattened for its entire length. Due to this bad condition some features are misinterpreted or insufficiently described in the original description. Therefore descriptive notes of the present fully mature males are given below.

The female is also described.

Male. — Total length, 39—41 mm; abdomen, 29.5—30.5 (incl. app.); hind wing, 23—25.5 mm; costal edge of pterostigma in fore wing, 3.0—3.5 mm.

Labrum with grey-green band along free border, the width of the band very narrow in one male but very broad in another male. Anteclypeus, lateral sides of postclypeus and bases of mandibles externally grey-green. Frons low, without anterior ridge, its superior surface largely grey-green but dark brown at base. Vertex and occipital plate dark brown. Postocellar ridges well-developed. Mid-dorsal width of oc-

cipital plate a quarter the length of frontal margin of occipital plate. Posterior margin of occipital plate concave and with a shallow median excision which is very small and V-shaped in some males. Crest of occiput with very long brown hairs. Rear of head brown but tempora with a pale green spot and a (lower) pale green band. Labrum and adjacent mouth parts pale green.

Prothorax dark brown, the hind lobe blackish brown. Dark colour of pterothorax blackish brown. Pale antehumeral stripes grey-green, very broad in male from Ecuador. Three pale lateral stripes of pterothorax olive-green.

Legs brown but inner sides of femora green. Third tarsi three-quarters the length of third tibia.

Abdomen dark brown, becoming blackish brown on apical segments. Sides of 1 entirely green. Sides of 2 largely green. Genital hamules and hood of penial peduncle brown. Sides of 3 with a long, triangular, green basal spot. Segments 2 to 7 with a pale mid-dorsal line which is rather wide and green on 2, narrow but green at base and becoming yellow at apex on 3, very fine and yellow on 4 to 7. Dorsum of 7 yellow on basal third. Caudal appendages black but upper surface of superiors pale on apical two-fifths. Inner process of branches of inferior appendage variable, generally reduced to a low hump but in some males entirely lacking; length of branch beyond this inner process (if available) also variable.

Venation of wings dark brown but costa with a very fine and inconspicuous yellow line. Pterostigma yellowish brown. Two cubito-anal cross-veins in addition to inner side of subtriangle in seven fore wings; other wings without extra cubito-anal cross-veins. Discoidal triangle open in one fore wing, two-celled in other wings. Subtriangle three-celled in two fore wings and two hind wings, two-celled in other wings. Supratriangle (once) crossed in two hind wings, open in other wings. Trigonal interspaces in fore wings starting with two rows of cells from triangle outwards, those in hind wings starting with a row of two (one male) or three (other males) cells against triangle followed by two rows of cells. Anal field in five fore wings one cell wide, in other fore wings two cells wide. Second anal interspace in three hind wings starting with a single large cell against anal vein, in other hind wings with two cells against anal vein.

Female (hitherto unknown; degutted and treated with acetone). — Total length, 37.5 mm;

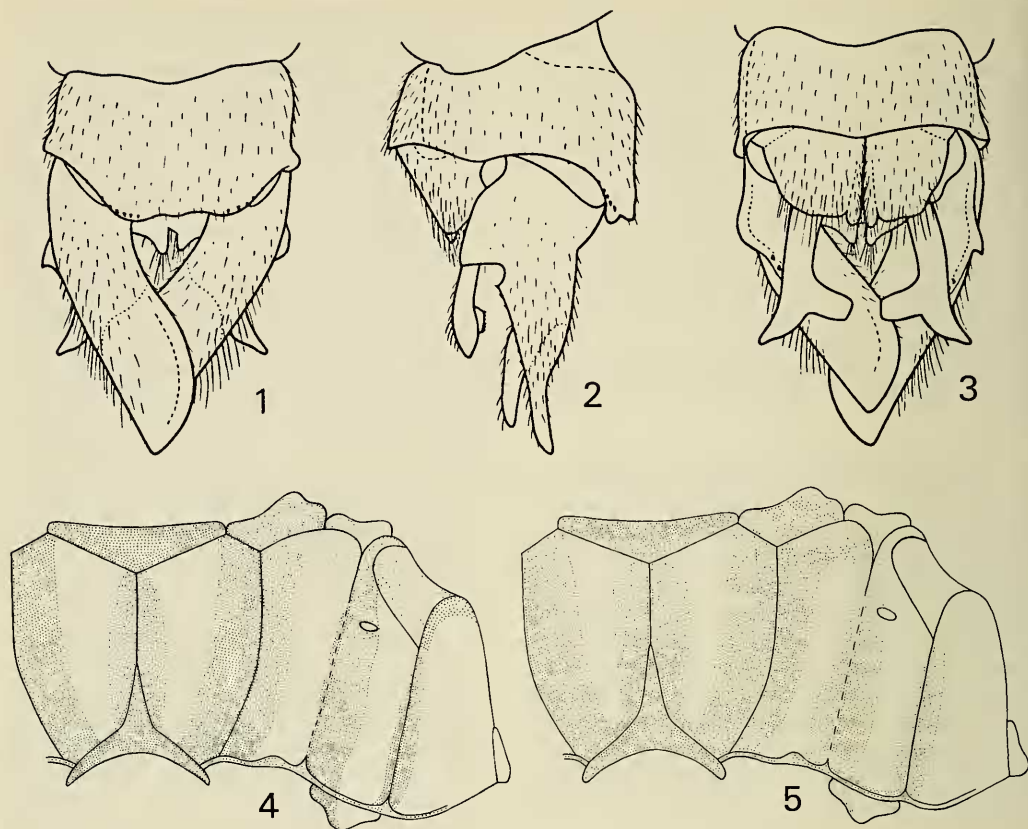
abdomen, 28 mm (incl. app.); hind wing, 26.5 mm; greatest width of hind wing, 8.2 mm; costal edge of pterostigma in fore wing, 3.7 mm.

Similar to male regarding stature and colour design but abdomen stouter. Grey-green anterior band on superior surface of frons narrower than in male, in dorsal view occupying one-third of superior surface of frons. Pale markings on pterothorax greenish white, on abdomen yellowish white. Second pale antehumeral stripes somewhat narrower than in male. Pale markings on abdomen as follows: A fine mid-dorsal line on 2 to 8; lateral stripes becoming successively shorter on 4 to 6, reaching to apex of segment on 2 and 3, and to a point half way the segment on 6, the stripes being interrupted by the supplementary transverse carinae; dorsum of 7 pale from base to supplementary transverse carinae. Abdominal segments 7, 8, 9, and 10 approximately in ratio 46 : 26 : 19 : 10, with the caudal appendages (stylets) 15 on the same scale. Vulvar lamina one-third the length of ninth sternum, its posterior margin medially excised U-shaped for three-quarters the length of vulvar lamina. Caudal appendages white at tips and spine-like pointed.

Basal subcostal cross-vein present. No extra cubito-anal cross-vein. Anal field in fore wings two cells wide. Nodal index 14 : 17—18 : 12/13 : 13—14 : 13. Second primary antenodal cross-vein the sixth in right fore wing, the fifth in other wings. Intermedian cross-veins 6—6/4—4 in fore and hind wings, respectively. Supratrangles open. Subtriangle in right fore wing two-celled, in other wings three-celled. Discoidal triangles two-celled. Trigonal interspaces starting with two (right fore wing) or three (other wings) cells against triangle followed by two rows of cells. Hind wings with five paranal cells, four (left) and five (right) postanal cells, and four to five rows of cells posterior to Cu2.

The female of *P. abbreviatus* resembles that of *P. phyllochromus* but the latter has the frons distinctly angled, the occipital plate much broader (mid-dorsal width two-fifths the length of frontal margin), and the fore wings generally with extra cubito-anal cross-veins.

Mr. De Marmels wrote me that several more females were seen and photographed at the place where the female described was captured (cf. De Marmels, 1981a: 40). The following venational characters could be determined from the colour slides: ♀ (1—15.viii.1979), number of antenodal cross-veins in left fore wing 16 and



Figs. 1—4. *Progomphus phyllochromus* Ris, ♂ holotype: 1, tenth abdominal segment and caudal appendages, dorsal view; 2, the same, left lateral view; 3, the same, ventral view; 4, diagram of thoracic colour pattern. Fig. 5. *Progomphus occidentalis* spec. nov., ♂ holotype: Diagram of thoracic colour pattern.

in left hind wing 12, discoidal triangles and sub-triangles in left wings two-celled; ♀ (viii-ix. 1979), nodal index of left pair of wings 11 : 14/ 12 : 11. A female collected by him at the same place on 25.ix.1981 has the following features: total length, 37.5 mm; abdomen, 27.5 mm; hind wing, 25 mm; costal edge of pterostigma in fore wing, 3.8 mm. Sternum of abdominal segment 10 not shorter than sternum of abdominal segment 9. All triangles and subtriangles two-celled. Trigonal interspace starting with two cells against triangle in fore wings, with three cells in hind wings. Nodal index 11 : 16—17 : 12/11 : 12—12 : 12. Second primary antenodal cross-vein the fifth in all wings (all data communicated by Mr. De Marmels).

The larva of *P. abbreviatus* was described by De Marmels (1981b).

#### *Progomphus occidentalis* spec. nov. (figs. 5, 18—22)

Material. — Venezuela (?): San Antonio, 1 ♂ (holotype), MP.

Male (abdomen broken between segments 5 and 6). — Total length, 43 mm; abdomen, 33.5 mm; hind wing, 26.5 mm; greatest width of hind wing, 8 mm; costal edge of pterostigma of fore wing, 3.6 mm.

Face brown. Frons low and slightly angled, its superior surface with a broad, leaden-grey anterior band. Vertex dark brown, the posterior ridge of lateral ocelli swollen and provided with long brown hairs. Occipital plate dark brown, its posterior margin concave in middle portion, provided with long brown hairs. Rear of head brown above. Tempora with a brown-yellow

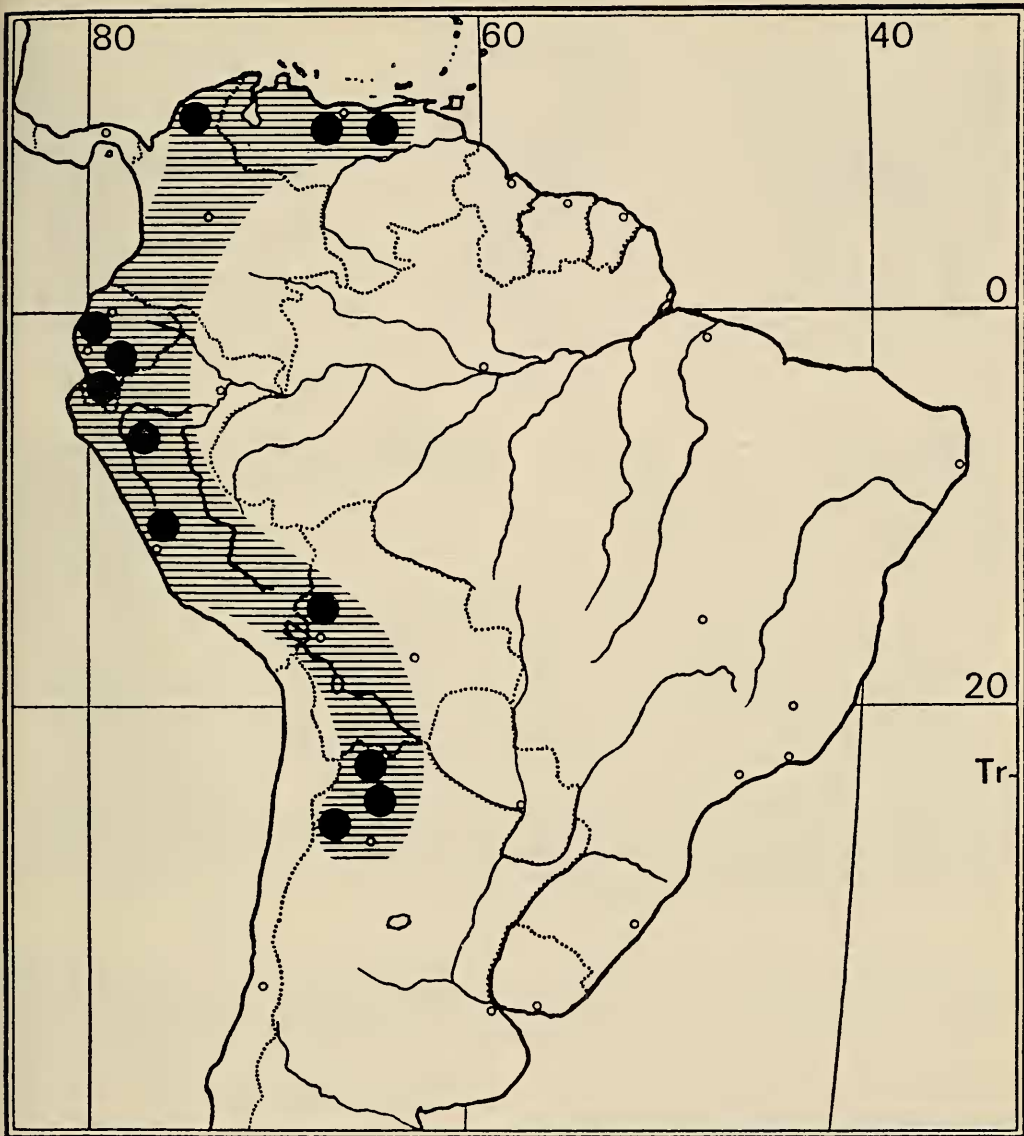


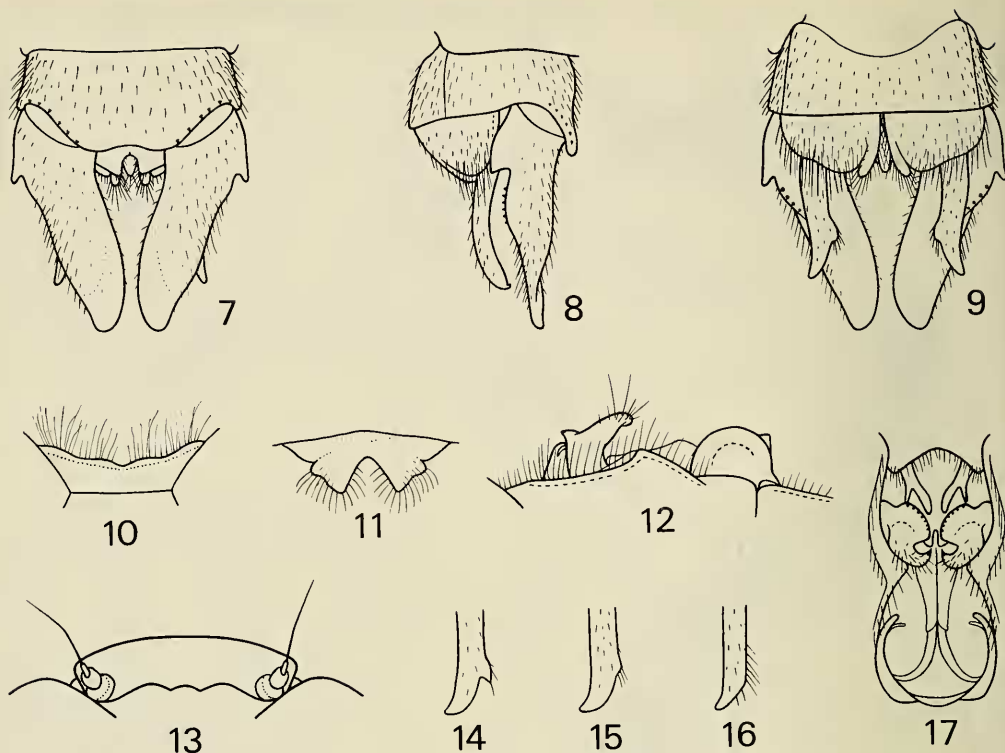
Fig. 6. Distribution of *Progomphus phyllochromus* Ris.

spot. Lower parts of rear of head brown-yellow. Labium and adjacent mouth-parts pale brown.

Prothorax dark brown. Pterothorax dark brown with green stripes, its colour design shaped as shown in diagram fig. 5.

Legs brown but inner side of first femora green. Third tibia three-quarters the length of third femur. Lamina tibialis of first tibiae one-fifth the tibial length.

Wings clear. Venation brown but frontal side of costa with a fine yellow line. Pterostigma brownish yellow, surmounting  $5\frac{1}{2}$ –6 cells. Distance between nodus and pterostigma  $2\frac{1}{2}$  times the length of pterostigma. Basal subcostal cross-vein present. Nodal index 11 : 15–16 : 10/11 : 11–12 : 11. Second primary antenodal cross-vein the fifth. Intermedian cross-veins 6–5/5–5 in fore and hind wings, respectively. All supratrangles open. All subtri-



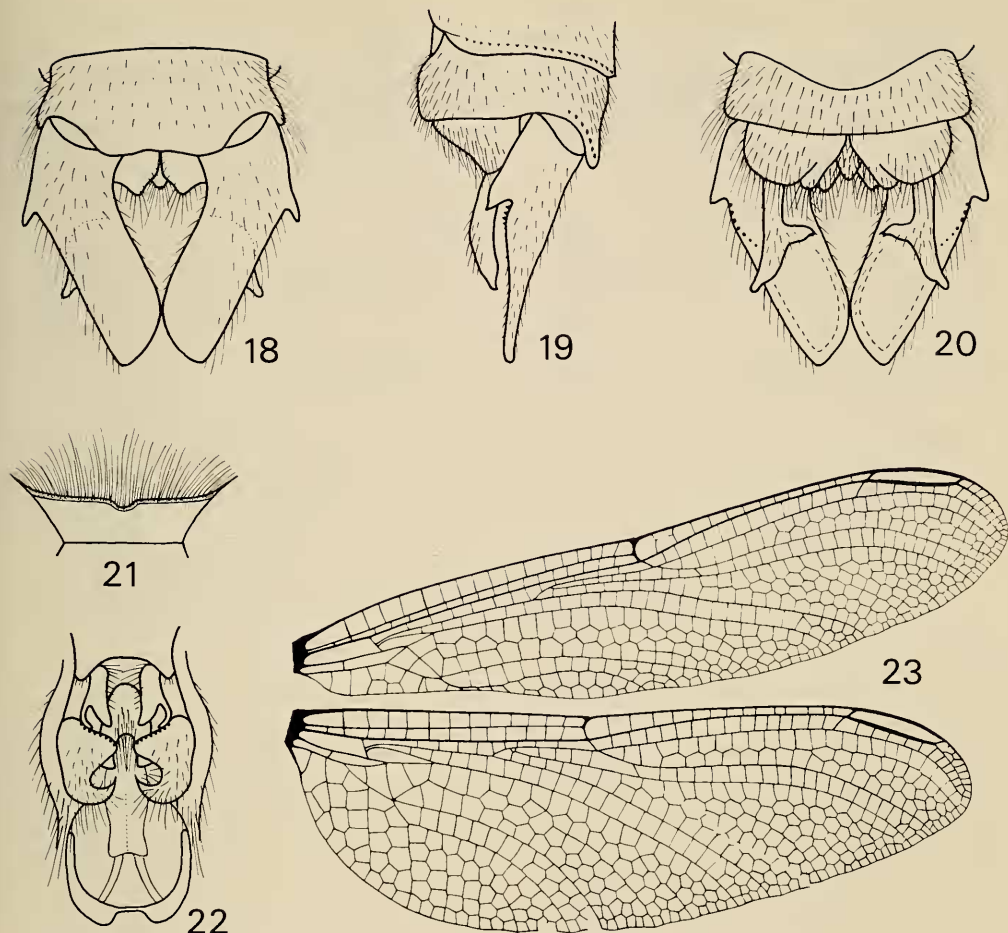
Figs. 7—17. *Progomphus abbreviatus* Belle: 7, tenth abdominal segment and caudal appendages of male, dorsal view; 8, the same, left lateral view; 9, the same, ventral view; 10, occipital plate of female; 11, vulvar lamina; 12, accessory genitalia, right lateral view; 13, frons of male, dorsal view; 14, ventral view of right branch of inferior caudal appendage, male from Miranda; 15, the same, another male from Miranda; 16, the same, male from Sierra San Lorenzo; 17, accessory genitalia, ventral view.

angles and discoidal triangles two-celled. There is an extra cubito-anal cross-vein in each wing. Trigonal interspace in fore wings starting with two rows of cells from triangle outwards (that of left fore wing with an extra initial cell next hind angle of triangle) eight cells long, in anterior row, that in hind wings starting with three rows of cells against triangle followed by two rows of cells two (right) and three (left) cells long, in anterior row. Anal field in right fore wing one cell wide, that in left fore wing with one of the cells doubled. Hind wings with five (right) and six (left) paranal cells, four rows of cells behind Cu2 and a three-celled anal triangle.

Abdomen predominantly dark brown. Mid-dorsum of segments 2 to 7 with a yellow line which is rather broad on segment 2 but which becomes very fine on segments 5 to 7. Sides of segment 2 with yellow marking behind and be-

low auricle. Lower parts of sides of segments 3 to 6 with yellow marking from base to apex of segment. Basal third portion of segment 7 yellow. Caudal appendages shaped as shown in accompanying figures, blackish brown, the superiors becoming pale on apical half.

The unique (pinned) specimen of *P. occidentalis* was found in the collection of René Martin at Paris. Attached to the pin is an old label "*Progomphus polygonus* Selys S. Antonio" but there is no label referring to the country in which the locality San Antonio lies. However, from its relationship with the other members of the *polygonus* group we can say that the specimen hails from western continental South America, hence the specific name *occidentalis*. But René Martin referred the male to *P. polygonus*, a species known only from Venezuela. I therefore suspect that the specimen is from the west of



Figs. 18—22. *Progomphus occidentalis* spec. nov., ♂ holotype: 18, tenth abdominal segment and caudal appendages, dorsal view; 19, the same, left lateral view; 20, the same, ventral view; 21, occipital plate; 22, accessory genitalia, ventral view. Fig. 23. *Progomphus polygonus* Selys, ♀ lectotype: right pair of wings.

this country (State of Táchira) where a village San Antonio lies.

*P. occidentalis* is intermediate between *P. phyllochromus* and *P. abbreviatus* but it is more closely related to the first than to the second species. The males of *P. occidentalis* and *P. phyllochromus* are distinguished by the following features: (1) apex of branches (part beyond anteapical inner process) of inferior caudal appendage longer in *P. occidentalis* than in *P. phyllochromus*; (2) inner process of branches of inferior caudal appendage acute and ending in two minute teeth in *P. occidentalis*, truncated and furnished with a marginal row of minute teeth in *P. phyllochromus*; (3) lateral outer side

of superior caudal appendages between basal dilatation and proximal denticle of inferior carina not emarginated in *P. occidentalis*, widely emarginated in *P. phyllochromus*; (4) tip of posterior hamule of accessory genitalia very acutely pointed and strongly recurved in *P. occidentalis*, and longer than that in *P. phyllochromus*.

#### REFERENCES

- Belle, J., 1973. A revision of the New World genus *Progomphus* Selys, 1854 (Anisoptera: Gomphidae). — *Odonatologica* 2: 191—308.  
 —, 1975. Two new gomphine species from Paraguay (Anisoptera: Gomphidae). — *Odonatologica* 4: 129—135.

- , 1980. Two new gomphoidine species from Brazil (Anisoptera: Gomphidae). — *Odonatologica* 9: 173—180.
- De Marmels, J., 1981a. *Aeshna rufipes* Ris in Venezuela, with a description of the male (Anisoptera: Aeshnidae). — *Odonatologica* 10: 39—42.
- , 1981b. The larva of *Progomphus abbreviatus* Belle, 1973 from Venezuela (Anisoptera: Gomphidae). — *Odonatologica* 10: 147—149.
- , 1983. The Odonata of the region of Mount Auyantepui and the Sierra de Lema, in Venezuelan Guyana. 3. Additions to the families Gomphidae, Aeshnidae and Corduliidae, with description of *Progomphus racenisi* spec. nov. — *Odonatologica* 12: 5—13.
- Knopf, K. W. & K. J. Tennessen, 1980. A new species of *Progomphus* Selys, 1854 from North America (Anisoptera: Gomphidae). — *Odonatologica* 9: 247—252.
- Needham, J. G., 1941. Life history studies on *Progomphus* and its nearest allies (Odonata: Aeshnidae). — *Trans. Am. ent. Soc.* 67: 221—245; pl. 20.
- Ris, F., 1918. Libellen (Odonata) aus der Region der amerikanischen Kordilleren von Costarica bis Catamarca. — *Arch. Naturg.* 82 (9): 1—197; 2 tabs.
- Selys Longchamps, E. de, 1878. Quatrièmes additions au synopsis des Gomphines. — *Bull. Acad. r. Belg.* (2) 46: 408—471, 658—698 (3—106 sep.).
- St. Quentin, D. 1973. Die Gomphidenfauna Südamerikas (Ordn.: Odonata). — *Annln naturh. Mus. Wien* 77: 335—363.